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EXAMINER	
CALANDRA, ANTHONY J	

ART UNIT	PAPER NUMBER
4128	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/560,651	RYU, HAI-IL	
	Examiner	Art Unit	
	ANTHONY J. CALANDRA	4128	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 December 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/11/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Office Action

1. The communication dated 12/13/05 has been entered and fully considered.

2. Claims 1-4 are currently pending.

Priority

3. Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Korea on 3/17/2005. It is noted, however, that applicant has not filed a certified copy of the 10-2005-0022304 application as required by 35 U.S.C. 119(b).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korean Patent Publication 1992-0000746 EUN-MOK, hereinafter EUN-MOK in view of U.S. Patent Publication 5,944,953 LAVOIE et al., hereinafter LAVOIE et al., and WIPO publication WO 2004/009900A1 SABOURIN, hereinafter SABOURIN.

As for claim 1, EUN-MOK discloses a process for chemimechanical (semichemical) pulping of wood chips (*A method for manufacturing semichemical pulpfrom wood chips comprising* [see e.g. paragraph 19]). EUN-MOK discloses that the wood chips should be cut to a size of 2 x 3 cm which falls within the instant claimed range (*(i) a pretreatment process of cutting wood chips to a size of 1 cm X 1 cm to 5 cm X 5 cm* [see e.g. paragraph 24]). EON-MOK teaches the process conditions of 0.1 to 3% caustic soda (NaOH), which falls within the instant claimed range. EUN-MOK also discloses the specific point of 0.5% caustic, which falls within the instant claimed range. EUN-MOK further teaches the process temperature of 20-30 degrees Celsius which overlaps with the instant claimed range (*(2) a refining process of refining the pretreated woodchips with 0.05-15 wt% of caustic soda (a steaming solution), based on the total weight of the woodchips, at 25-85 degrees C* [see e.g. paragraph 19 and 28]). Further, it would be obvious to a person of ordinary skill in the art would be able to optimize the treatment temperature to higher values [see e.g. MPEP 2144.05 II B]. Higher temperatures increase chemical reactions and thus a person of ordinary skill in the art could reasonably expect more delignification and lower refiner energy requirements at higher temperatures.

EUN-MOK discloses that the chemimechanical process is for pine chips [see e.g. paragraph 19]. EUN-MOK does not disclose using the chemimechanical process for cornstalks. LAVOIE et al. teaches a chemimechanical (semichemical) process for treating corn stalks [see e.g. abstract] where the corn stalks are chopped to 1 inch in size (2.54 cm) [see e.g. column 1 lines 45-52]. LAVOIE et al. discloses that other chemimechanical processes can be used to convert stalks into pulp using chemicals such

as soda (NaOH/caustic), sulfite and mechanical treatment of refiners [see e.g. column 2 lines 10-18]. At the time of the invention it would have been obvious to a person of ordinary skill in the art to apply a known method of chemimechanical pulping of EUN-MOK to cornstalks. A person of ordinary skill in the art would be motivated to try this method as LAVOIE et al. clearly discloses that chemimechanical methods including those that use NaOH and sulfite are appropriate for stalks [see e.g. column 2 lines 10-18]. The use of known pulping method such as the chemimechanical caustic/sulfite method of EUN-MOK to improve the value cornstalks, which are lignocelluosic materials like woodchips, by turning them into pulp, would have been *prima facie* obvious. A person of ordinary skill in the art could reasonably expect the method of EUN-MOK to pulp the cornstalks.

Neither EUN-MOK nor LAVOIE et al. disclose that the refiner should be run at normal pressure or 3-10 kg/cm^2 pressure. SABOURIN teaches a chemimechanical method of pulping wood chips [see e.g. abstract]. SABOURIN discloses a refiner pressure of 5.2 bar (5.2 kg/cm^2), which falls within the broad instant claimed range, for refining wood chips (*at normal pressure or a pressure of 3-10 kg/cm2* [see e.g. pg 19 lines 5-10]). SABOURIN states that the refining pressure needed is dependent on the glass temperature of lignin which is effected by chemical treatment. Chemical treatment lowers the glass temperature and thus the pressure needed for fiberization [see e.g. pg 19 lines 5-10]). At the time of the invention it would have been obvious to try the refining pressure taught in SABOURIN in the cornstalk chemimechanical pulping of EUN-MOK and LAVOIE et al. A person of ordinary skill in the art could reasonably expect success by using a known and successful refining pressure for a chemimechanical pulping

process of wood chips for the same chemimechanical process of corn stalks. Alternatively, it would also have been obvious for a person of ordinary skill in the art to optimize the refiner pressure of EUN-MOK and LAVOIE et al. to obtain the desired amount of fiberization [see e.g. MPEP 2144.05 II B]. Pressure is a clear result-effective variable which effects the amount of fiberization obtained at a constant retention time and refiner speed. A person of ordinary skill in the art could reasonable expect that by adjusting refiner pressure higher they would obtain more fiberization or by lowering pressure to they would obtain less fiberization.

As for claim 2, EUN-MOK discloses a process for chemimechanical pulping of wood chips (*A method for manufacturing semichemical pulp from wood chips comprising* [see e.g. paragraph 19]). EUN-MOK discloses that the wood chips should be cut to a size of 2 x 3 cm which falls within the instant claimed range (*(i) a pretreatment process of cutting wood chips to a size of 1 cm X 1 cm to 5 cm X 5 cm* [see e.g. paragraph 24]). EON-MOK further teaches the process conditions of 0.5 to 5% sodium sulfite and the specific value of 2%, which falls within the instant claimed range. EUN-MOK further teaches the process temperature of 20-30 degrees Celsius which overlaps with the instant claimed range (*(2) a refining process of refining the pretreated woodchips with 0.5 to 10 wt% of sodium sulfite or sodium bisulfite (a steaming solution), based on the total weight of the woodchips, at 25-85 degrees C* [see e.g. paragraph 19 and 28]). Further, it would be obvious to a person of ordinary skill in the art would be able to optimize the treatment temperature to higher values [see e.g. MPEP 2144.05 II B]. Higher temperatures increase chemical reactions and thus a person of ordinary skill in the art could reasonably expect more delignification and lower refiner energy requirements at higher temperatures.

EUN-MOK discloses that the chemimechanical process is for pine chips [see e.g. paragraph 19]. EUN-MOK does not disclose using the chemimechanical process for cornstalks. LAVOIE et al. teaches a chemimechanical (semichemical) process for treating corn stalks [see e.g. abstract] where the corn stalks are chopped to 1 inch in size (2.54 cm) [see e.g. column 1 lines 45-52]. LAVOIE et al. discloses that chemimechanical processes can be used to convert stalks into pulp using chemicals such as soda (NaOH/caustic), sulfite and mechanical treatment of refiners [see e.g. column 2 lines 10-18]. At the time of the invention it would have been obvious to a person of ordinary skill in the art to apply a known method of chemimechanical pulping of EUN-MOK to cornstalks. A person of ordinary skill in the art would be motivated to try this method as LAVOIE et al. clearly discloses that chemimechanical methods including those that use NaOH and sulfite are appropriate for stalks [see e.g. column 2 lines 10-18]. The use of known pulping method such as the chemimechanical caustic/sulfite method of EUN-MOK to improve the value cornstalks, which are lignocelluosic materials like woodchips, by turning them into pulp, would have been *prima facie* obvious. A person of ordinary skill in the art could reasonably expect the method of EUN-MOK to pulp the cornstalks.

Neither EUN-MOK nor LAVOIE et al. disclose that the refiner should be run at normal pressure or 3-10 kg/cm^2 pressure. SABOURIN teaches a chemimechanical method of pulping wood chips [see e.g. abstract]. SABOURIN discloses a refiner pressure of 5.2 bar (5.2 kg/cm^2), which falls within the broad instant claimed range, for refining wood chips (*at normal pressure or a pressure of 3-10 kg/cm2* [see e.g. pg 19 lines 5-10]). SABOURIN states that the refining pressure needed is dependent on the

glass temperature of lignin which is effected by chemical treatment. Chemical treatment lowers the glass temperature and thus the pressure needed for fiberization [see e.g. pg 19 lines 5-10]). At the time of the invention it would have been obvious to try the refining pressure taught in SABOURIN in the cornstalk chemimechanical pulping of EUN-MOK and LAVOIE et al. A person of ordinary skill in the art could reasonably expect success by using a known and successful refining pressure for a chemimechanical pulping process of wood chips for the same chemimechanical process of corn stalks. Alternatively, it would also have been obvious for a person of ordinary skill in the art to optimize the refiner pressure of EUN-MOK and LAVOIE et al. to obtain the desired amount of fiberization [see e.g. MPEP 2144.05 II B]. Pressure is a clear result-effective variable which effects the amount of fiberization obtained at a constant retention time and refiner speed. A person of ordinary skill in the art could reasonable expect that by adjusting refiner pressure higher they would obtain more fiberization or by lowering pressure to they would obtain less fiberization.

As for claim 3, EUN-MOK discloses a process for chemimechanical pulping of wood chips (*A method for manufacturing semichemical pulp from wood chips comprising* [see e.g. paragraph 19]). EUN-MOK discloses that the wood chips should be cut to a size of 2 x 3 cm which falls within the instant claimed range (*(i) a pretreatment process of cutting wood chips to a size of 1 cm X 1 cm to 5 cm X 5 cm* [see e.g. paragraph 24]). EON-MOK further teaches the process conditions of 0.5 to 5% sodium sulfite and .1-3% caustic which overlap with the instant claimed ranges. EUN-MOK further teaches the specific values of 2% sodium sulfite and 0.5% NaOH, which fall within the instant claimed ranges. EUN-MOK discloses the process temperature of 20-30 degrees Celsius

which overlaps with the instant claimed range (*(2) a chemical treatment process of adding a mixture solution of 0.05-3.0 wt% of caustic soda and 0.2-5 wt% of sodium sulfite, based on the total weight of the woodchips, to the pretreated cornstalks and applying heat and pressure in the range of 25-45 degrees C* [see e.g. paragraph 19 and 28]). Further, it would be obvious to a person of ordinary skill in the art would be able to optimize the treatment temperature to higher values [see e.g. MPEP 2144.05 II B]. Higher temperatures increase chemical reactions and thus a person of ordinary skill in the art could reasonably expect more delignification and lower refiner energy requirements at higher temperatures.

EUN-MOK discloses that the chemimechanical process is for pine chips [see e.g. paragraph 19]. EUN-MOK does not disclose using the chemimechanical process for cornstalks. LAVOIE et al. teaches a chemimechanical (semichemical) process for treating corn stalks [see e.g. abstract] where the corn stalks are chopped to 1 inch in size (2.54 cm) [see e.g. column 1 lines 45-52]. LAVOIE et al. discloses that chemimechanical processes can be used to convert stalks into pulp using chemicals such as soda (NaOH/caustic), sulfite and mechanical treatment of refiners [see e.g. column 2 lines 10-18]. At the time of the invention it would have been obvious to a person of ordinary skill in the art to apply a known method of chemimechanical pulping of EUN-MOK to cornstalks. A person of ordinary skill in the art would be motivated to try this method as LAVOIE et al. clearly discloses that chemimechanical methods including those that use NaOH and sulfite are appropriate for stalks [see e.g. column 2 lines 10-18]. The use of known pulping method such as the chemimechanical caustic/sulfite method of EUN-MOK to improve the value cornstalks, which are lignocelluosic materials like

woodchips, by turning them into pulp, would have been *prima facie* obvious. A person of ordinary skill in the art could reasonably expect the method of EUN-MOK to pulp the cornstalks.

Neither EUN-MOK nor LAVOIE et al. disclose that the refiner should be run at normal pressure or 3-10 kg/cm^2 pressure. SABOURIN teaches a chemimechanical method of pulping wood chips [see e.g. abstract]. SABOURIN discloses a refiner pressure of 5.2 bar (5.2 kg/cm^2), which falls within the broad instant claimed range, for refining wood chips (*pressure in the range of 3-10 kg/cm2* [see e.g. pg 19 lines 5-10]). SABOURIN states that the refining pressure needed is dependent on the glass temperature of lignin which is effected by chemical treatment. Chemical treatment lowers the glass temperature and thus the pressure needed for fiberization [see e.g. pg 19 lines 5-10]). At the time of the invention it would have been obvious to try the refining pressure taught in SABOURIN in the cornstalk chemimechanical pulping of EUN-MOK and LAVOIE et al. A person of ordinary skill in the art could reasonably expect success by using a known and successful refining pressure for a chemi-mechanical pulping process of wood chips for the same chemi-mechanical process of corn stalks. Alternatively, it would also have been obvious for a person of ordinary skill in the art to optimize the refiner pressure of EUN-MOK and LAVOIE et al. to obtain the desired amount of fiberization [see e.g. MPEP 2144.05 II B]. Pressure is a clear result-effective variable which effects the amount of fiberization obtained at a constant retention time and refiner speed. A person of ordinary skill in the art could reasonable expect that by adjusting refiner pressure higher they would obtain more fiberization or by lowering pressure to they would obtain less fiberization.

EUN-MOK discloses that the fibers undergo refining ((3) a first refining process of defibrating the chemical-treated cornstalks with a refiner [see e.g. paragraph 19])

EUN-MOK teaches that after the first beating (refining process) the defibered wood chips then have 10-20% peroxide added and 15-30% sodium silicate added and then refined and bleached in a second refiner. Both ranges fall within the instant claimed ranges, further EUN-MOK teaches the specific points of 15% peroxide and 22% silicate which fall within the instant claimed range (*(4) a second refining process of adding 5-20 wt% of hydrogen peroxide and 7-30 wt% of sodium silicate, based on the total weight of the cornstalks, to the cornstalks to refine and bleach them* [see e.g. paragraph 19, 30 and 31]

As for claim 4, EUN-MOK discloses treating the wood chips at 65 degrees C after the chips have been chipped and prior to the sodium sulfide/caustic treatment [see e.g. paragraph 25-27].

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY J. CALANDRA whose telephone number is (571)270-5124. The examiner can normally be reached on Monday through Friday, 7:30 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Barbara Gilliam can be reached on (571) 272-1330. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Barbara L. Gilliam/
Supervisory Patent Examiner, Art Unit 4128

AJC